

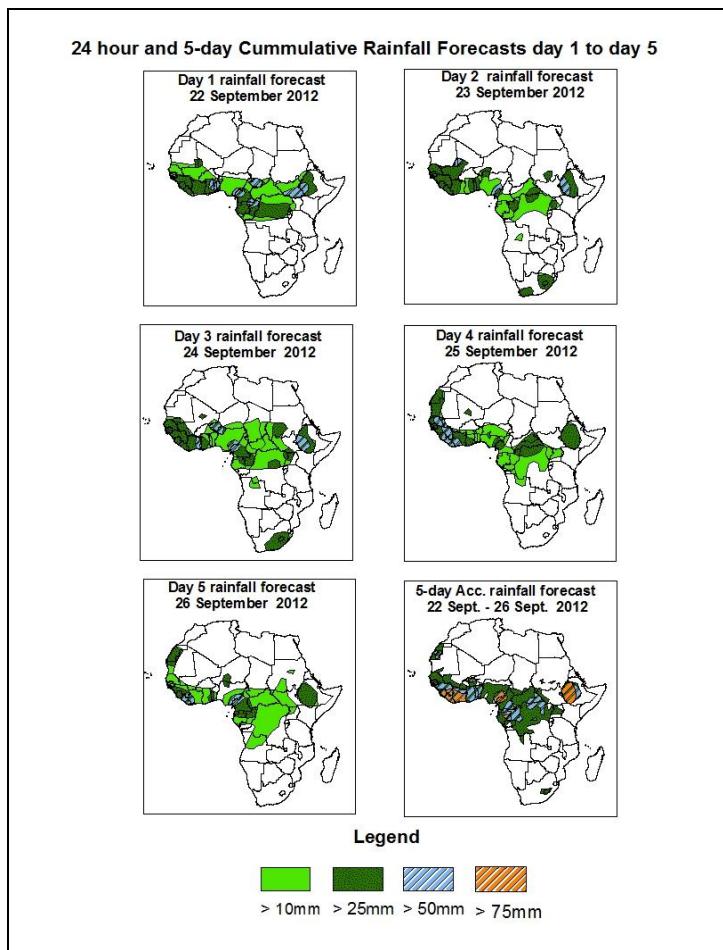


## NCEP Contributions to the WMO Severe Weather Forecasting Demonstration Project (SWFDP) and to the African Monsoon Multidisciplinary Analysis (AMMA) Initiative

### 1.0. Rainfall Forecast: Valid 06Z of September 22<sup>nd</sup> – 06Z of September, 26<sup>th</sup> 2012. (Issued at 13:00Z of September, 21<sup>st</sup> 2012)

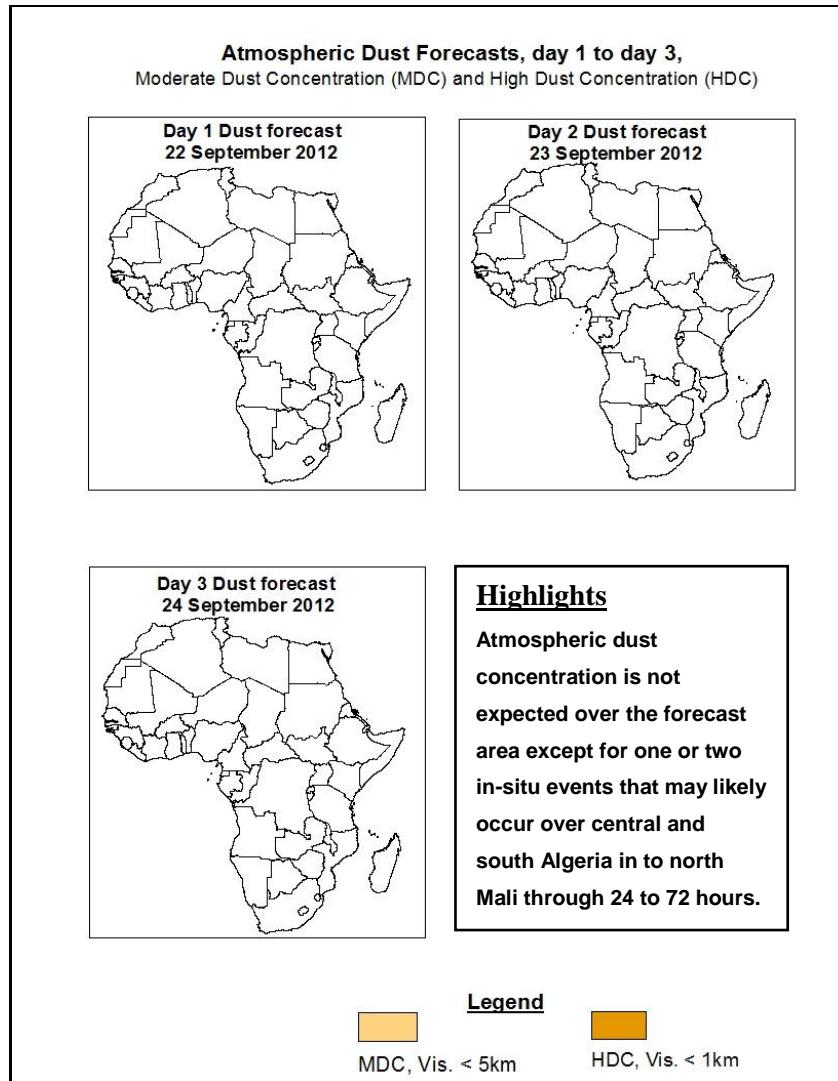
#### 1.1. Twenty Four Hour Cumulative Rainfall Forecasts

The forecasts are expressed in terms of 75% probability of precipitation (POP) exceeded, based on the NCEP, UK Met Office and the ECMWF NWP outputs, the NCEP global ensemble forecasts system (GEFS) and expert assessment.



#### Summary

In the next five days, ITD is expected to fluctuate between 08°N and 20°N with moderate to strong monsoon depth within 24 to 120 hours; also the TEJ, AEJ and the AEW propagation with vortices within the 850 to 700hpa pressure level fields are expected to enhance rainfall activities over parts of South Sudan Republic, Cameroon and Nigeria; South Chad; portions of the Sahel Region, Sierra Leone and Guinea Conakry; Northern Guinea Gulf Countries; part of Central African Republic; West and North Ethiopia.



### 1.3. Model Discussion: Valid from 00Z of September, 21<sup>st</sup> 2012.

The heat lows over Mauritania, Mali, Algeria, Niger, Chad and Sudan are expected to fluctuate in their positions while deepening and filling up and vice versa, through 24 to 120 hours, according to the GFS, ECMWF and UKMET models.

According to the GFS model, a thermal low over south-west and coastal Mauritania (1011hpa) in 24 hours is expected to steadily decrease its core value to 1007hpa through 48 to 120 hours especially over the east, south and coastal Mauritania. The second low over south Algeria and Mali (1010hpa) in 24 hours is expected to decrease its core value to 1009hpa in 72 hours and tends to gradually decrease to 1007hpa through 96 to 120 hours. The third low over North Chad and Niger (1008hpa) in 24 hours is expected to decrease to 1006hpa in 96 hours and tends to increase to 1007hpa

through 96 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is expected to decrease to 1004hpa in 96 hours and tends to increase to 1005hpa in 120 hours.

The ECMWF model shows a thermal low over the coast and south-west Mauritania (1010hpa) in 24 hours that is expected to maintain this central value through 48 to 120 hours over Mauritania. The second low over South Algeria and North Mali (1010hpa) in 24 hours is expected to maintain this central value through 48 to 72 hours and tends to decrease to 1008hpa through 96 to 120 hours. The third low over North Chad and Niger (1009hpa) in 24 hours is expected to increase in its core value to 1010hpa in 72 hours and tends to decrease its central value to 1008hpa through 96 to 120 hours; while the low over North Sudan (1006hpa) in 24 hours is expected to maintain almost the same core value through 48 to 120 hours.

The UKMET model shows a thermal low over north and central Mauritania (1010hpa) in 24 hours is expected to maintain this core value through 48 to 96 hours and tends to decrease to 1007hpa in 120 hours. The second low over south Algeria and north Mali (1009hpa) in 24 hours is expected to maintain this core value through 48 to 72 hours and tends to decrease gradually to 1007hpa through 96 to 120 hours. The third low over North Chad and Niger (1008hpa) in 24 hours is expected to increase in core value to 1009hpa in 48 hours and tends to decrease gradually to 1006hpa through 72 to 120hours; while the low over North Sudan (1006hpa) in 24 hours is expected to fluctuate in core value between 1005hpa and 1006hpa through 48 to 120 hours.

According to the UKMET model, the St. Helena High pressure system over South Atlantic Ocean with a core value of 1027hpa in 24 hours locates at latitude 30°S is expected to increase its core value to 1029hpa in 48 hours and tends to increase in its core value to 1031hpa while moving southward to latitude 40°S in 120 hours.

According to the ECMWF model, the central pressure value of 1027hpa in 24 hours locates at latitude 30°S is expected to fluctuate between 1027hpa and 1028hpa central value while remaining quasi-stationary at the same latitudinal position of 30°S through 48 to 96 hours and tends to increase its core value to 1033hpa in 120 hours while moving southwards to latitude 40°S.

Lastly, according to the GFS model, the central pressure value of 1027hpa in 24 hours locates at latitude 30°S is expected to fluctuate between 1026hpa and 1028hpa central value while remaining quasi-stationary at the same latitudinal position of 30°S through 48 to 96 hours and tends to increase its core value to 1031hpa in 120 hours while moving southwards to latitude 40°S.

According to the GFS model, the Azores high pressure system over North Atlantic Ocean with its central pressure value of 1036hpa in 24 hours and locates at longitude 45°W is expected to gradually decrease in its core value to 1030hpa through 48 to 120 hours while fluctuating between longitudes 40°W and 45°W.

According to the ECMWF model, the central pressure value of 1035hpa in 24 hours and locates at longitude 45°W is expected to gradually decrease in its core value to 1026hpa through 48 to 120 hours while fluctuating between longitudes 40°W and 45°W.

Lastly, according to the UKMET model, the central pressure value of 1036hpa in 24 hours and locates at longitude 45°W is expected to gradually decrease in its core value to 1029hpa through 48 to 120 hours while fluctuating between longitudes 40°W and 45°W.

At 925hpa level, a zone of moderate dry northerly and northeasterly winds (25kts) is expected to prevail over central Algeria, north Chad, north Mauritania, north Mali, south Libya and north east Niger through 24 to 72 hours.

At the 850hpa level, a lower tropospheric wind convergence associated with strong and significant West African Monsoon inflow and depth between latitude 08°N and 20°N is expected to prevail over parts of Mauritania, Mali, Niger, Sudan, Chad and Western Africa through 24 hours to 120 hours. Vortices are expected over the Niger/Nigeria border; north-east Democratic Republic of Congo; central Chad; south-east Niger; east Mali; Cote d'Ivoire; South Sudan Republic and the Gambia/Senegal border. The convergence associated with the meridional arm of the ITCZ is expected to oscillate between portions of South Sudan Republic; North and Central Democratic Republic of Congo; West and North Uganda; South and East Central African Republic and the Great Lake Countries through 24 hours to 120 hours.

At 700hpa level, the AEJs seem to be disappearing as no significant jets were observed on the weather charts. The African Easterly Waves (AEW) is also expected to propagate westwards affecting parts of Chad, Democratic Republic of Congo, Guinea-Conakry, Cote d'Ivoire, Ghana, Cameroon, Central African Republic, South Sudan Republic, Sierra Leone, Mali, Nigeria, Senegal, Mauritania and Niger within 24 to 120 hours. Vortices are expected over north Congo and the Gambia/Senegal border.

At 500hpa level, a wave is expected to affect parts of Mauritania, Mali, Nigeria, Niger, Cameroon, Central Africa Republic, Senegal, Ghana, Togo, Benin Republic, Cote d'Ivoire, Democratic Republic of Congo, Chad, South Sudan Republic and Gambia, through 24 to 120 hours with no vortices expected over the forecast area within 24 to 120 hours.

At 150mb, the Tropical Easterly Jets are very weak with a maximum core of 05 to 15 Knots and a slight north-easterly orientation to the wind flow, but will continue to affect most parts of West Africa, Chad, Cameroon, South Sudan Republic, the South Guinea Gulf Countries; parts of Ethiopia, Kenya and Central African Republic, and North Sudan through 24 to 120 Hours.

In the next five days, ITD is expected to fluctuate between 08°N and 20°N with moderate to strong monsoon depth within 24 to 120 hours; also the TEJ, AEJ and the AEW propagation with vortices within the 850 to 700hpa pressure level fields are expected to enhance rainfall activities over parts of South Sudan Republic, Cameroon and Nigeria; South Chad; portions of the Sahel Region, Sierra Leone and Guinea Conakry; Northern Guinea Gulf Countries; part of Central African Republic; West and North Ethiopia.

Atmospheric dust concentration is not expected over the forecast area except for one or two in-situ events that may likely occur over central and south Algeria in to north Mali through 24 to 72 hours.

## 2.0. Previous and Current Day Weather Discussion over Africa

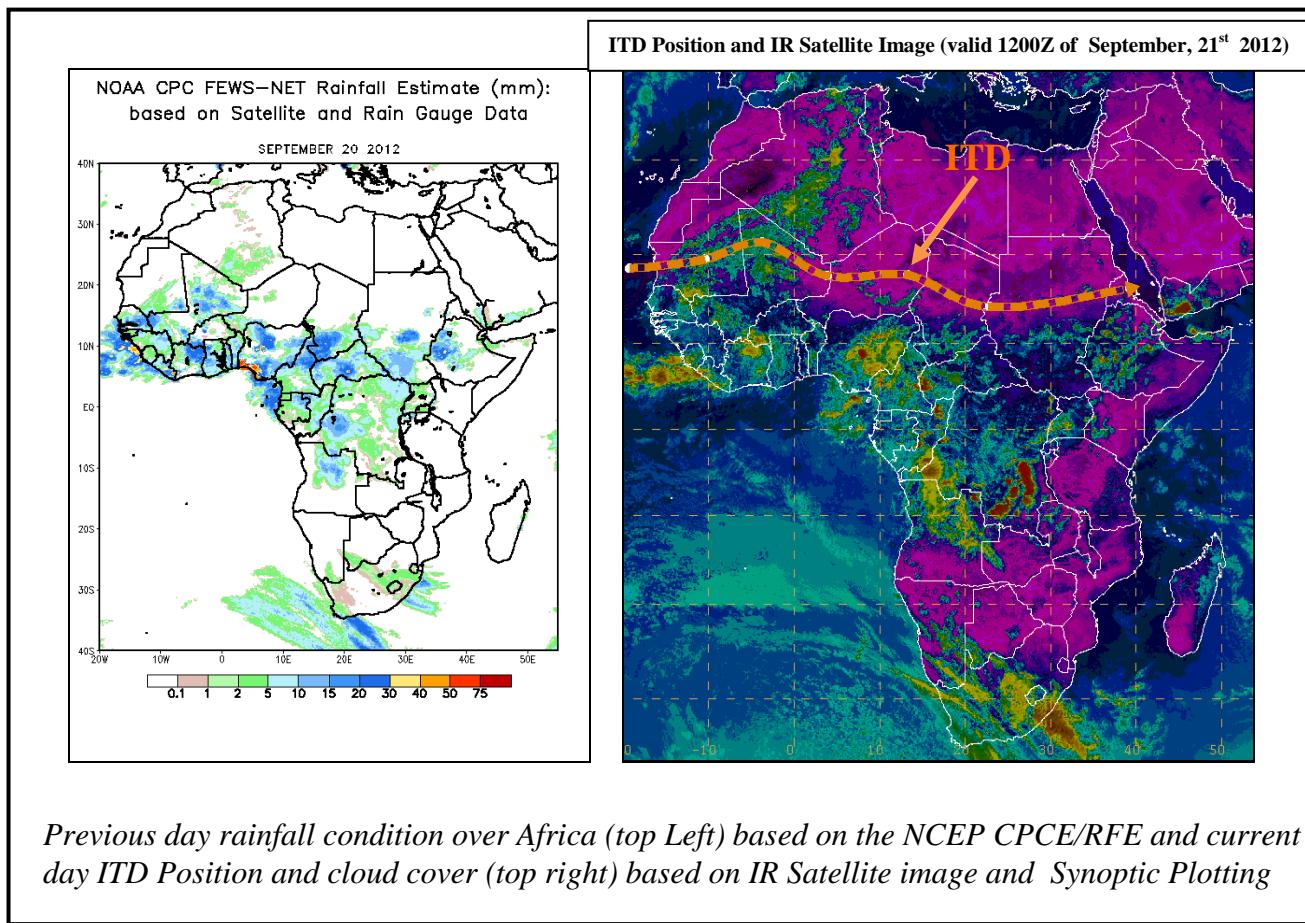
(September, 20<sup>th</sup> 2012 – September, 21<sup>st</sup> 2012)

### 2.1. Weather assessment for the previous day (September, 20<sup>th</sup> 2012)

During the previous day, moderate to heavy rainfall was observed over parts of Mauritania; Algeria; Guinea Conakry; Cote d'Ivoire; Eritrea; Congo; Gabon; Sierra Leone; Mali; Niger; Nigeria; Chad; Cameroon; Democratic Republic of Congo; Central African Republic; South Sudan Republic; Ethiopia; Angola; Ghana; South Africa; Lesotho and Benin.

### 2.2. Weather assessment for the current day (September, 21<sup>st</sup> 2012)

Convective activities observed across parts of Mali; Niger; Burkina Faso; Nigeria; Chad; Democratic Republic of Congo; Cameroon; Congo; South Sudan Republic; Ethiopia; Uganda; Somalia; Mauritania; Senegal; Guinea-Conakry; Sierra Leone; Ghana; Togo; Kenya; Botswana; Namibia; Gabon Zambia; South Africa and Central African Republic.



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